

FROM			DATE
Chief, PPBS			14 May 1970
TO	INITIALS	DATE	REMARKS
DIRECTOR	4	CLC	5/18 Excellent tradeoff amount
DEP/DIRECTOR	3	DP	5/15
EXEC/DIRECTOR	2	<del>1</del>	5/15
SPECIAL ASST	1	M	5/15
ASST TO DIR	3	PAUL	5/18
ASST TO DEP/DIR			
CH/PPBS			
DEP CH/PPBS			
EO/PPBS			
CH/IEG			
DEP CH/IEG			
EO/IEG			
CH/PSG			
DEP CH/PSG			
EO/PSG			
CH/TSSG			
DEP CH/TSSG			
EO/TSSG			
CH/SSD/TSSG			
PERSONNEL			
LOGISTICS			
TRAINING			
RECORDS MGT			
SECURITY			
FINANCE			
DIR/IAS/DDI	DECLASS REVIEW by NGA/DOD		
CH/DIAXX-4			
CH/DIAAP-9			

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14 May 1970  
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## MEMORANDUM FOR THE RECORD

SUBJECT: Center Decision on the Light Table and Rhomboid Problem

1. On 5 May 1970, the Executive Director, NPIC met with the Chiefs of IEG, TSSG, and PPBS, and members of their organizations, to be briefed on the 1540 light table/rhomboid situation and to receive a recommendation as to the course of action to pursue regarding these items of equipment.

2. Following introductory remarks by the Chief, PPBS as to the purpose of the briefing, [ ] IEG presented the factors and rationale which were the basis for IEG's decision to utilize the [ ] Model 28 Rhomboid (as opposed to the [ ] Model II) and the [ ] light table (as opposed to the [ ]) Significant points of that presentation are shown below:

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25XA. Light Table

Outstanding film drive system.

Dry light source.

Quiet and cool operation.

Poor stereoscope mount design.

Counterbalance system for carriage movement in "Y" axis inferior.

Other minor design and human engineering deficiencies.



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Outstanding stereoscope mount design.

Film threading display and automatic switching feature superior.

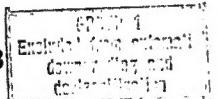
Poor film drive system.

Excessive heat from light source.

Poor history of performance from liquid cooled light source - leaks and air bubble formation.

Recent phenomenon of green hue in the mineral oil (coolant).

Other minor deficiencies and human engineering deficiencies.

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(1) Both the [ ] prototype tables require rework or modification to several features. The companies provided their solutions to each problem in letters of intent, presenting their methods for solution in general terms.

(2) TSSG/RED analysed the proposed solutions and assigned confidence statements to each. These statements, plus IEG's assessment, result in relatively high confidence that [ ] can correct their deficiencies and produce an acceptable light table. This confidence is based primarily on the strength of their outstanding film drive system and the cool, "dry" light source.

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(3) [ ] may be able to correct most of their deficiencies; however, the many problems associated with the liquid cooled light source, and the history of poor performance of this type of light source on their 940 Split Format Light Tables introduces a high degree of uncertainty in [ ] ability to solve this problem.

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(4) Unit costs significantly favor the [ ] table.

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#### B. Rhomboids

##### Model 28

Image rotation in eyepieces.

Objective lenses not parfocal - working distances not uniform.

Interchangeable objective lenses.

Individual focus control on each objective lens.

0.43X, 1.0X and 2.0X objective lenses - 3-60X magnification

Rhomboid assembly slides to rear of Zoom 240 Pod when operation is changed from stereo to mono.

Stereo mode - 10% less light transmittance than the Model II.

##### Model II

Image rotation in the rhomboid arms.

Parfocal objectives and uniform working distance.

Interchangeable objective lenses.

Individual focus control on each objective lens.

1.0X, 2.0X and 3.0X objective lenses - 7-90X magnification.

Automatic shift via optical switch - stereo to mono or vice versa.

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Mono mode - 5 time more light transmitted than the Model II.

Stereo mode - 10% more light transmittance than the Model 28.

Optical resolution essentially equal to Model II. Slightly less "off axis."

Optical resolution essentially equal to Model 28. Slightly better "off axis."

(1) From a subjective standpoint, the IEG photointerpreters considered the two instruments to be equal in performance in the stereo mode. However, the light reduction in the Model II in the mono mode is dramatic; the PI's were unanimous in their preference for the Model 28 for mono operation.

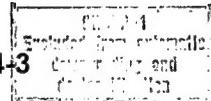
(2) An experiment was conducted by TSSG/RED/ATB and the [ ] to assess the effect of light loss on interpretability. The experiment, utilizing IEG PI's as subjects, compared the two instruments in stereo and mono modes of operation. PI performance in the stereo mode was approximately equal when viewing with the Model II and the Model 28. In the mono mode, the percentage of confidence in reporting targets was slightly higher for the Model 28. The significance of this difference and the effect it might have on the exploitation process is unknown.

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(3) The Model II operational utility is less encumbered than the Model 28. The physical actions required of the operator to change from one mode of operation to another are minimized by the parfocality of objective lenses and the optical switch of the Model II. However, the light loss in the mono mode of the Model II, and the psychological effect this loss has on the PI, make the mono mode of operation of the Model II undesirable.

(4) In summary -

- a. Approximately equal optical resolution qualities of the Model II and Model 28.
- b. Approximately equal performance of each system in the stereo mode.
- c. Apparent higher performance of the Model 28 in the mono mode.
- d. Psychological effects of light loss in mono of the Model II.



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- e. PI preference for the Model 28.
- f. More rapid production of the Model 28.
- g. Significantly lower cost of Model 28.

3. The second portion of the briefing, given by Chief, IEG was a rundown of PI positions within the Center, the purpose of which was to provide the basis for the third portion of the briefing - the numbers of light tables/rhomboids required by IEG.

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[redacted] presented the following information:

	<u>Number of PI's</u>	
	<u>CIA</u>	<u>DIA</u>
FY 70 T/O	114	116
FY 71 T/O	20	20
Conversion in FY 71 T/O of CSR's to PI's	9	
Additional req. upon DIA to match CIA's input		7
	143	143
Less PI supervisors	13	13
Working PI's	130	130

4. On the basis of the numbers of working PI's, and the decision by IEG that each of these PI's must be equipped with the 1540/rhomboid set in order to exploit the mission inputs predicted, [redacted] IEG, proposed that IEG's total equipment order for light tables should be as follows:

260	- 1 each working PI
<u>5</u>	- maintenance, training, etc.
<u>265</u>	

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It was recognized that this statement of equipment needs differed from earlier statements in two respects; namely, (1) our previously indicated (5-Year Plan, etc.) total was for 223 units, and (2) the light table total was previously spread through FY 73. The decision to increase the numbers was based on the following:

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a. A reassessment by Chief, IEG of the situation the [ ] will impose upon IEG's exploitation resources, and the action taken by IEG, in this regard, to convert 9 collateral support positions to working PI positions.

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b. A review of the 940 light tables presently in IEG's inventory and the decision not to supplement the 1540 inventory by these 940's.

5. The last part of the briefing was concerned with alternative approaches to meeting the funding requirements of the 1540's and rhomboids. These alternatives are covered in Attachment A.

6. At this meeting the Executive Director, NPIC made the following decisions:

a. 265 sets (light table plus rhomboid) of equipment are basic to the Center's exploitation needs;

b. the [ ] Table and the [ ] Model 28 Rhomboid be acquired to satisfy the total inventory needs of 265 sets;

c. to accept the alternative funding approaches recommended, with emphasis being placed on Alternative 1 - a request that additional funding for the total package be requested;

d. no further R&D work at this time be undertaken on the [ ] Model II Rhomboid;

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e. The FY 70 R&D project proposal, Low Power Objective Lenses [ ] be placed in hold because of its direct relation to the Model II Rhomboid; and

f. consideration be given by TSG for a project in the FY 71 R&D Program devoted to investigating methods of improving light sources - for example, point light sources or collimated light.

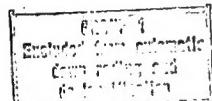


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Chief  
Planning, Programming & Budgeting Staff

**Distribution:**

Orig - NPIC/ODIR  
1 - NPIC/IEG  
1 - NPIC/PSG  
1 - NPIC/TSSG  
2 - NPIC/PPBS



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Approved For Release 2005/06/22 : CIA-RDP78B05703A000100070014-3

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COMMUNITY REQUIREMENTS

Mod "28" Rhomboid

Air Force	-	29
Navy	-	15
DIA	-	6
		50
NPIC		<u>265</u>
		315
IAS (?)		<u>12</u>
		327

Light Table

Army	-	27
Air Force	-	63
IAS	-	<u>16</u>
		106
NPIC		<u>265</u>
		371

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PRODUCTION

	Mod "28" Rhomboid	Light Table 25X1
By Jan '71	60	90
Feb	80	130
Mar	100	170
Apr	120	210
May	140	250
Jun	160	290
July	180	330
Oct	240	
Jan '72	300	
Feb	320	

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